Occipital seizures imitating migraine aura

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SUMMARY

Three cases are reported in which symptoms of occipital seizures resembled the visual aura of migraine. Careful recording of the characteristics and timing of such visual effects will often resolve the diagnostic dilemma.

Though migraine and occipital epilepsy are different disorders, they have symptoms in common[1,2]. The visual phenomena that precede headache in migraine are also common in occipital lobe seizures[1,2] However, distinction between them is not usually difficult. In epileptic seizures, elementary visual hallucinations are brief, lasting for three minutes at most; they are predominantly multicoloured, with circular or spherical patterns; and their onset is always on the same side. There is no photophobia. Post-ictal headache is common but rarely throbbing and severe.

In migraine, the visual features of the aura are predominantly black and white with linear and zigzag patterns; they seldom last less than 3 min. Photophobia is usual, and severe throbbing headache and vomiting follows.

In basilar migraine[3,4], 'teichopsia' or blindness affects both visual fields and is associated with neurological symptoms such as vertigo, ataxia, tinnitus and bilateral peripheral dysaesthesias. The subsequent headache is severe, throbbing, posterior, and bilateral.

Here we report three cases in which the visual features of occipital seizures resembled migraine aura.

CASE HISTORIES

Case 1

A 14-year-old boy had weekly episodes of visual hallucinations beginning at age 8. They lasted for 5–15 s and consisted of three or four concentric spherical rings of red and yellow moving from the left to the right visual field and repeating the same course after their disappearance on the right. On other occasions there was only one coloured ball moving continuously from left to right. The colours were faint at onset, becoming more intense and brilliant as the attack progressed. There was no impairment of consciousness, convulsion, or headache. He was diagnosed as having migraine aura without headache. After age 10 years, on four occasions, the concentric rings were bigger (double the size) and the attack lasted longer (1 min) with probable left hemianopia. On three subsequent occasions the duration was 2–3 min and the visual effects were followed by left-sided tonic deviation of the head with clonic movements of the left face and arm; he then lost consciousness and became cyanosed. The patient does not think that he lost consciousness—only that he was unable to speak when spoken to. This lasted for 10 min. Post-ictally he was exhausted, wanted to sleep and had severe headache for 4–5 h. At this stage occipital lobe seizures were suspected.

Three electroencephalograms (EG), with the patient both awake and asleep, were normal between attacks. High resolution magnetic resonance imaging (MRI) of the brain showed no abnormality. After carbamazepine 600 mg daily was started at age 11 years no further seizures of any type occurred up to the last follow-up at age 14.

Case 2

A 13-year-old boy started having brief visual attacks two or three times daily at the age of 7 years. They consisted of brilliant multi-coloured spots and circles lasting for a few seconds. There was no loss of consciousness or convulsion.

On occasions, his vision went black, he felt himself to be spinning around, and he perceived that big coloured balls were covering his body. He fell on the ground because 'my legs gave way', and remained there for 1–2 min. Post-ictally he was pale and tired and complained of headache. Routine and sleep EEG and MRI and computed tomographic brain scans were normal. The diagnosis elsewhere was basilar migraine, for which he received pizotifen without benefit. When he was given carbamazepine 200 mg twice daily the visual symptoms stopped, and they began again when carbamazepine was withdrawn for three months at age 12 years. He is now seizure-free on the same medication.

Case 3

From age 17 a 22-year-old-student had eleven simple visual partial seizures. Objects in the left visual field became blurred and resembled a videotape in fast-forward mode.

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Table 1 **Occipital seizures with visual symptoms versus migraine with visual aura and basilar migraine**

Occipital seizures with visual symptoms	*Migraine with visual aura*	*Basilar migraine*
Visual hallucinations		
Mainly multicoloured and circular. Blindness may be part of the ictus or occur independently of the visual hallucinations	Homonymous field visual hallucinations with extra bright or dark areas, bright zigzag lines expanding outwards with or without scotomata	As in migraine aura but bilateral. Blindness is common and may occur *ab initio*
Associated symptoms and progress		
Symptoms may be associated or progress to deviation of the head and eyes and forced eyelid closure. These may progress to partial seizures of temporal lobe or fronto-parietal symptoms with impairment of consciousness and generalized tonic–clonic seizures	Symptoms may be associated or progress to unilateral dysaesthesia, dysphasia and other neurological deficits. Hemianopia may occur. Impairment of consciousness or convulsion does not occur	Visual symptoms associated with neurological manifestations of brain stem involvement. Impairment of consciousness follows: slow in onset, not profound, and not causing the patient to fall down
Headache		
Mild ictal headache is rare but post-ictal headache and vomiting is frequent lasting 30 min to 1 h	Aura followed by headache, typically unilateral, pulsating, severe and often associated with nausea and photophobia lasting for 4–72 h	Headache bilateral, posterior, severe, throbbing and follows the above symptoms
Duration		
The visual seizures last for 1–3 min at most. Ictal symptoms may be longer, 3–4 min, when spread to other cortical areas occurs. Simple or complex status epilepticus is rare	Symptoms develop gradually. May last for hours in migraine with aura	Time course similar to migraine with aura
Lateralization		
Onset of seizures is stereotyped and always on the same side	Symptoms usually unilateral but with side alterations	Symptoms bilateral

Within 20–60 s his visual hallucinations were dominated by disturbed features of objects and faces and he was overwhelmed by a feeling of panic. The whole episode, which was stereotyped, lasted for 2–4 min without impairment of consciousness. Bitemporal headache followed for 20 min, not severe or throbbing. On two occasions at age 18 and 21 years, after partial sleep deprivation, the visual hallucinations were followed by generalized convulsions. The patient refuses to take medication and the attacks continue. Findings on neuro-ophthalmological evaluation are entirely normal, as is high resolution MRI of the brain. Two EEGs, one during sleep and awakening, showed some non-specific bilateral posterior slow waves with right-sided emphasis.

DISCUSSION

Elementary visual hallucinations, particularly when combined with blindness, vomiting and headache, tend to be diagnosed as migraine with aura even though they are also common features of occipital lobe seizures (Table 1). The main cause of misdiagnosis is failure to evaluate visual hallucinations quantitatively and qualitatively[2]. Instead, they are erroneously referred to as fortification spectrum, teichopsia, scintillating scotoma, and phosphenes—terms that often misrepresent what the patient is describing[2]. The migrainous elementary visual effects are called fortifications because of their similarities with bastioned pentagonal fortifications, not the castellated appearances of battlements. Spectrum is used in the meaning of apparition and not of a coloured band of light. Teichopsia (*teichos*=town wall, *opsis*=vision) represents the bastioned form of transient hemiopia. Scintillating (*scintilla*=spark) scotoma (*skotos*=darkness) is used because of the sparkling appearance of the migraine visual hallucinations (brilliant flashes of light in the periphery of dark areas in the visual fields). Photopsias (*phos*=light, *opsis*=vision) are unformed flashes of light and sparks.

Benign childhood occipital seizures (BCOS)[5,6] is the epileptic syndrome most commonly mistaken for migraine. The resemblance is such that the first published cases of BCOS were reported as basilar migraine, with seizures and

severe EEG abnormalities of occipital spikes secondary to brain ischaemia. Subsequent observations have established the epileptic nature of this syndrome[5,6] and it became clear that BCOS can be confidently diagnosed even if the EEG is normal, as demonstrated by cases 1 and 2 in this report[1,2,5].

Partial seizures with elementary visual hallucinations, often progressing to generalized convulsions, occur in one-fourth of children with video-game-induced seizures[7] and they are common clinical manifestations of the idiopathic forms of occipital lobe epilepsy (which may be photosensitive or not).

Elementary visual hallucinations, blindness and headache are also common ictal symptoms of seizures due to structural lesions of the occipital lobes—such as head injuries, arteriovenous malformations or tumours[1]. Complex visual hallucinations of the kind reported in case 3 are more likely to raise the suspicion of epileptic seizures, though migraine with the syndrome of 'Alice in Wonderland'[8] can not be totally excluded—particularly since the visual effects can arise before, after or even without headache. Also in favour of epilepsy in case 3 was the brevity of the effects and the sensation of panic.

Headache, the cardinal symptom of migraine, is a frequent post-ictal event, especially after generalized convulsions and occipital lobe seizures[1,9]. There are rare reports of headache as an ictal manifestation of seizures, but the ache is more discomfort in the head than true pain[10,11]. It is always associated with other epileptic symptoms. One of the two patients of Laplante *et al.*[10] complained of 'painful emptiness of the head' and the other of 'a painful feeling of pressure or shiver' in the temporal regions. Depth electrode studies during ictal 'headache' showed this to be associated with paroxysmal activity from the right hippocampus.

Vomiting is a rare ictal manifestation in adults with epileptic seizures[12] but a cardinal feature in the early onset BCOS, where it is commonly accompanied by deviation of the eyes[1,5].

In conclusion, epileptic seizures originating from the occipital lobes often manifest with symptoms that physicians mistake for migraine with aura. Also, the concept of 'epileptic seizures triggered by migrainous events' may need re-evaluation as since most of the reported cases are probably genuine visual partial epileptic seizures[1,2]. Elementary visual hallucinations, blindness, headache and vomiting, which are common manifestations of occipital lobe epilepsies, should not be unquestioningly equated with migraine. Scrupulous evaluation of symptoms in migraine and occipital lobe epilepsy is often rewarding.

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